

SHUTTLE CRITICAL ITEMS LIST - ORBITER

SUBSYSTEM : EPD&C - AFT-RCS

FMEA NO 05-6KA-2029 -2

REV: 11/03/87

ASSEMBLY : PANEL 07
 P/N RI : ME452-0102-7106
 P/N VENDOR:
 QUANTITY : 4
 : FOUR
 :

ABORT,	CRIT. FUNC:	1R
RTLS, TAL	CRIT. HDW:	3
VEHICLE	102	103 104
EFFECTIVITY:	X	X X
PHASE(S):	PL	LO X OO X DO X LS

PREPARED BY:
 DES D SOVEREIGN
 REL J BEERMAN
 QE

REDUNDANCY SCREEN: A-PASS B-PASS C-PASS
 APPROVED BY:
 DES *R.S. R. Berman*
 REL *M. S. (11-14-87)*
 QE *11/17/87*

APPROVED BY (NASA):
 SSM *[Signature]*
 REL *[Signature]*
 QE *[Signature]*

EPD&C SSM [Signature]
7-2-87

ITEM:

TOGGLE SWITCH (SP3T) HERMETIC SEAL - LEFT AND RIGHT AFT RCS FUEL AND OXIDIZER TANK ISOLATION VALVE 3/4/5 A AND B (MANUAL COMMAND).

FUNCTION:

PROVIDES THE CREW WITH THE CAPABILITY TO SELECT GPC (GENERAL PURPOSE COMPUTER) OR MANUAL (OPEN, CLOSE) CONTROL FOR THE FUEL AND OXIDIZER TANK ISOLATION VALVES 3/4/5 A AND B. UNIQUE TO INTACT ABORT. 33V73A7 S17, 18, 20, 21.

FAILURE MODE:

INADVERTENT OPERATION, SHORT, INADVERTENTLY CLOSSES (ONE CONTACT SET).

CAUSE(S):

CONTAMINATION, MECHANICAL SHOCK, VIBRATION.

EFFECT(S) ON:

- (A) SUBSYSTEM (B) INTERFACES (C) MISSION (D) CREW/VEHICLE
- (A) LOSS OR DEGRADATION OF ABILITY TO ENERGIZE THE AFFECTED VALVE DRIVE CIRCUIT.
- (B) LOSS OF ABILITY TO CLOSE OR OPEN ONE PROPELLANT TANK ISOLATION VALVE 3/4/5 A AND B. LOSS OF TANK ISOLATION CAPABILITY. LOSS OF ABILITY TO PERFORM CROSSFEED OPERATIONS THROUGH MANIFOLDS 3, 4 AND 5 (VERNIER THRUSTERS).
- (C) POSSIBLE MISSION MODIFICATION OR EARLY MISSION TERMINATION.
- (D) NO EFFECT FOR NOMINAL MISSION - CRITICALITY INCREASED TO 1/1 DURING RTLS AND TAL ABORT. VALVE UTILIZED BY MCA OPTIMIZATION SOFTWARE IN "LANDING HEAVY" CONDITION. WILL ALSO RESULT IN CONTROL PROBLEMS DURING ENTRY. RESULTS IN LOSS OF 12 AFT RCS THRUSTERS BEING USED DURING THE OMS DUMP.

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(E) FUNCTIONAL CRITICALITY EFFECT - POSSIBLE CREW/VEHICLE LOSS DUE TO INABILITY TO PERFORM EXTERNAL TANK SEPARATION OR ENTRY CONTROL RESULTING FROM LOSS OF PROPELLANT THROUGH A LEAKY THRUSTER. REQUIRES 2 OTHER FAILURES (MANIFOLD VALVE FAILED OPEN, THRUSTER LEAK).

DISPOSITION & RATIONALE:

(A) DESIGN (B) TEST (C) INSPECTION (D) FAILURE HISTORY (E) OPERATIONAL USE

(A-D) FOR DISPOSITION AND RATIONALE REFER TO APPENDIX A, ITEM NO. 1 - TOGGLE SWITCH.

(B) GROUND TURNAROUND TEST

COMPONENT CHECKED OUT EVERY FLIGHT DURING GROUND TURNAROUND. THE TESTING CONSISTS OF CYCLING VALVE MANUAL SWITCHES AND/OR SENDING GPC COMMANDS TO CYCLE VALVES OR HEATERS WHILE MONITORING VEHICLE INSTRUMENTATION TO DETERMINE IF COMPONENTS HAVE FAILED.

(E) OPERATIONAL USE

IF VALVE IS FAILED OPEN, DO NOT CROSSFEED OR INTERCONNECT TO AFFECTED POD. LOSS OF INTERCONNECT CAPABILITY MAY RESULT IN MISSION MODIFICATION OR EARLY MISSION TERMINATION. IF VALVE IS FAILED CLOSED, USE REDUNDANT VALVE. IF REDUNDANT VALVE FAILS, RCS CROSSFEED CAN BE USED TO SUPPLY PROPELLANT TO AFFECTED LEGS.